

REMARKS

This application has been reviewed in light of the Office Action mailed on February 13, 2003. Claims 1-46 are pending in the application with Claims 1, 15 and 29 being in independent form. By the present amendment, the specification and Claims 1, 14, 15, 20, 21, 28, 29, 37, 40, 42 and 43 have been amended. Claim 41 has been canceled. No new matter or issues are believed to be introduced by the amendments.

The disclosure was objected to due to an informality. The disclosure has been amended in a manner which is believed to obviate the objection. Accordingly, withdrawal of the objection is respectfully requested.

Claims 1, 14, 15 and 28 were objected to due to informalities. Claims 1, 14, 15 and 28 have been amended in a manner which is believed to obviate the objections. Accordingly, withdrawal of the objections is respectfully requested.

I. Rejection of Claims 1, 3, 6-22, 25-31 and 34-46 Under 35 U.S.C. §103(a)

Claims 1, 3, 6-22, 25-31 and 34-46 were rejected under 35 U.S.C. §103(a) over U.S Patent No. 5,144,120 issued to Krichever et al. ("Krichever et al.") in view of U.S Patent No. 5,410,140 issued to Bard et al. ("Bard et al.").

Claim 1 in part recites "... at least one flexible connector mechanically coupling the scanner and the circuit board such that a range of oscillation between the scanner and the circuit board is possible through at least one flexing action of said connector."

(Emphasis added)

Krichever et al. is directed to a mirrorless scanner with movable laser, optical and sensor components. A mirrorless scanner arrangement mounts one or more of these

components on a drive for repetitive reciprocating movement either about an axis or in a plane to effect scanning. Krichever et al. does not disclose or suggest at least one flexible connector mechanically coupling a scanner and a circuit board such that a range of oscillation between the scanner and the circuit board is possible through at least one flexing action of the connector as recited by Applicant's Claim 1.

Bard et al. does not cure the deficiencies of Krichever et al. Bard et al. is directed to an optical scanner module for directing a light beam to scan an optically encoded symbol. The module includes an optical element mounted for oscillatory motion to scan the light beam in one direction by a flex element capable of torsional flexure. This oscillatory motion is induced by the interactive magnetic fields established by a permanent magnet mounted to the flex element and an electromagnetic coil driven by an AC current. Bidirectional light beam scanning is achieved by mounting an assembly of the flex element, optical element and permanent magnet to one or more additional flex elements for oscillatory motion to scan the light beam in a second direction. This oscillatory motion is induced by the inclusion of an additional permanent magnet and/or electromagnetic coil. Bard et al. does not disclose or suggest at least one flexible connector mechanically coupling a scanner and a circuit board such that a range of oscillation between the scanner and the circuit board is possible through at least one flexing action of the connector as recited by Applicant's Claim 1.

Accordingly, Krichever et al. and Bard et al., taken alone or in any proper combination, do not disclose or suggest at least one flexible connector mechanically coupling a scanner and a circuit board such that a range of oscillation between the scanner

and the circuit board is possible through at least one flexing action of the connector as recited by Applicant's Claim 1. Claims 15 and 29 include similar recitations as Claim 1. Therefore, it is believed that Claims 1, 15 and 29 are patentably distinct over prior art references, taken alone or in any proper combination, and accordingly, withdrawal of the rejection of Claims 1, 15 and 29 under 35 U.S.C §103(a) over Krichever et al. in view of Bard et al. and allowance thereof are respectfully requested.

Claims 3, 6-14, 16-22, 25-28, 30-31 and 34-46 depend from Claims 1, 15 and 29 and thus are limited by the language found therein. Accordingly, for at least the reasons given above, withdrawal of the rejection with respect to Claims 3, 6-14, 16-22, 25-28, 30-31 and 34-46 under 35 U.S.C §103(a) over Krichever et al. in view of Bard et al. and allowance thereof are respectfully requested.

II. Rejection of Claim 2 Under 35 U.S.C. §103(a)

Claim 2 was rejected under 35 U.S.C. §103(a) over Krichever et al. in view of Bard et al. and U.S. Patent No. 6,141,436 issued to Srey et al. ("Srey et al.").

Claim 2 depends from Claim 1 and as such is limited by the language therein. Accordingly, for at least the reasons given above, withdrawal of the rejection with respect to Claim 2 under 35 U.S.C §103(a) over Krichever et al. in view of Bard et al. and Srey et al. and allowance thereof are respectfully requested.

III. Rejection of Claims 4, 23 and 32 Under 35 U.S.C. §103(a)

Claims 4, 23 and 32 were rejected under 35 U.S.C. §103(a) over Krichever et al. in view of Bard et al. and European Patent No. 0731417 issued to Stern et al. ("Stern et al.").

Claims 4, 23 and 32 depend from Claims 1, 15 and 29 and thus are limited by the language therein. Accordingly, for at least the reasons given above, withdrawal of the rejection with respect to Claims 4, 23 and 32 under 35 U.S.C §103(a) over Krichever et al. in view of Bard et al. and Srey et al. and allowance thereof are respectfully requested.

IV. Rejection of Claims 5, 24 and 33 Under 35 U.S.C. §103(a)

Claims 5, 24 and 33 were rejected under 35 U.S.C. §103(a) over Krichever et al. in view of Bard et al. and U.S. Patent No. 6,195,053 issued to Kodukula et al. ("Kodukula et al.").

Claims 5, 24 and 33 depend from Claims 1, 15 and 29 and thus are limited by the language therein. Accordingly, for at least the reasons given above, withdrawal of the rejection with respect to Claims 5, 24 and 33 under 35 U.S.C §103(a) over Krichever et al. in view of Bard et al. and Kodukula et al. and allowance thereof are respectfully requested.

V. Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that all claims presently pending in the application, namely, Claims 1-40 and 42-46, are believed to be in condition for allowance and patentably distinguishable over the art of record.

If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call Applicant's undersigned attorney at the number indicated below.

Respectfully submitted,



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AMENDMENTS TO THE CLAIMS:

Please cancel Claim 41 and amend Claims 1, 14, 15, 20, 21, 28, 29, 37, 40, 42 and 43 as follows:

1. (Amended) A device comprising:

means for providing an oscillating magnetic field;

a printed circuit board;

a moving beam scanner, the scanner comprising:

a substrate;

a laser light source mounted to the substrate;

at least one light receiving photodiode mounted to the substrate;

a cap mounted over the substrate;

a lens for focusing the laser light source onto a target;

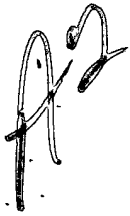
a lens for collecting light reflected from the target;

means mounted to the scanner for interacting with the means for providing an oscillating magnetic field; and

at least one flexible connector mechanically ~~and electrically~~ coupling the scanner and the circuit board such that a range of oscillation between the scanner and the circuit board is possible through at least one flexing action of said connector; and

~~wherein the scanner lacks a mirror and a scanning component.~~

2. (Original) The device of claim 1, wherein the device is a mobile phone, pager, or personal data assistant.
3. (Original) The device of claim 1, wherein the substrate comprises a printed circuit board having an area of approximately 4.times.4 mm.
4. (Original) The device of claim 1, wherein the laser light source comprises a VCSEL laser chip.
5. (Original) The device of claim 1, wherein the at least one light receiving photodiode comprises a CCD device.
6. (Original) The device of claim 1, wherein the cap, focusing lens and receiving lens are formed of plastic.
7. (Original) The device of claim 1, wherein the magnet is mounted to the cap.
8. (Original) The device of claim 1, wherein the magnet is mounted to the substrate.



9. (Original) The device of claim 1, wherein the at least one flexible connector comprises a plurality of resilient spring-like members, one end of each member attached to the printed circuit board and the other end attached to the scanner.
10. (Original) The device of claim 9, wherein the other end of each member is attached to the substrate.
11. (Original) The device of claim 9, wherein there are at least 5 members.
12. (Original) The device of claim 1, wherein the range of oscillation is $\pm 20^\circ$ relative to a central rest position.
13. (Original) The device of claim 1, wherein the means for providing an oscillating magnetic field comprises a vibration motor and the means mounted to the scanner for interacting comprises a magnet mounted to the cap, wherein the vibration motor is arranged externally relative to the cap.
14. (Amended) The device of claim 1, wherein the scanner is oscillated such that the laser light source, focusing lens and cap remain fixed relative to ~~each~~ each other.
15. (Amended) ~~In combination,~~ a A moving-beam scanner and a scanning component combination for imparting motion to the beam:

the scanner comprising:

a substrate;

a light source mounted to the substrate;

at least one light-receiving photodiode mounted to the substrate;

a cap mounted over the substrate;

a lens for focusing the light source onto a target;

a lens for collecting light reflected from the target;

flexible connector means for mechanically coupling the scanner and the circuit board such that a range of motion between the scanner and the circuit board is possible through at least one flexing action of said connector;

means mounted to the scanner for interacting with the scanning component;

and

wherein the scanning component is positioned adjacent to and outside the cap.

16. (Original) The combination of claim 15, wherein the scanner lacks a mirror.

17. (Original) The combination of claim 15, wherein the scanning component comprises a vibration motor having an oscillating magnet.

18. (Original) The combination of claim 17, wherein the means mounted to the scanner for interacting with the scanning component comprises a magnet.

19. (Original) The combination of claim 15, wherein the scanning component comprises an electromagnetic coil.

20. (Amended) The combination of claim 19, wherein the flexible connector ~~means~~ mounted to the scanner for interacting with the scanning component comprises a mechanical pivot.

21. (Amended) The combination of claim 20 19, wherein the flexible connector is formed from a spring-like, elastic or other spatially-deformable structure ~~pivot comprises~~ a shaft mounted within a bracket holder, the shaft being mechanically attached to the scanner.


22. (Original) The combination of claim 15, wherein the substrate comprises a printed circuit board having an area of approximately 4.times.4 mm.

23. (Original) The combination of claim 15, wherein the light source comprises a VCSEL laser chip.

24. (Original) The combination of claim 15, wherein the at least one light receiving photodiode comprises a CCD device.

25. (Original) The combination of claim 15, wherein the cap, focusing lens and receiving lens are formed of plastic.
26. (Original) The combination of claim 15, wherein the means for interacting with the scanning component is mounted to the cap.
27. (Original) The combination of claim 15, wherein the means for interacting with the scanning component is mounted to the substrate.
28. (Amended) The combination of claim 15, wherein the scanner is capable of range of oscillation of $\pm 20^\circ$ relative to a ~~control~~ central rest position
29. (Amended) A moving-beam scanner comprising:
- a light source;
 - at least one light-receiving photodiode;
 - lens means for focusing the light source onto a target and collecting light reflected from the target;
 - housing means; and
 - means associated with the scanner for interacting with a scanning component to impart motion to the beam while maintaining the light source, lens means and housing means fixed relative to each other; wherein said motion is

imparted and constrained by at least one flexible connector ~~the housing means~~
~~lacks a mirror.~~

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30. (Original) The scanner of claim 29, further comprising a substrate.
31. (Original) The scanner of claim 30, wherein the substrate comprises a printed circuit board having an area of approximately 4.times.4 mm.
32. (Original) The scanner of claim 29, wherein the light sources comprises a VCSEL laser chip.
33. (Original) The scanner of claim 29, wherein the at least one light-receiving photodiode comprises a CCD device.
34. (Original) The device of claim 29, wherein the lens means comprises a lens for focusing the light source onto a target and a lens for receiving light reflected from the target.
35. (Original) The scanner of claim 30, wherein the housing means comprises a cap mounted over the substrate.

36. (Original) The scanner of claim 35, wherein the cap and lens means are formed of plastic.

37. (Amended) The scanner of claim 35, wherein the means associated with the scanner comprises a magnet and a plurality of flexible ~~connections~~ connectors attached to the scanner.

38. (Original) The scanner of claim 35, wherein the means associated with the scanner comprises a magnet, the magnet is mounted to the cap.

39. (Original) The scanner of claim 30, wherein the means associated with the scanner comprises a magnet, the magnet is mounted to the substrate.

40. (Amended) The scanner of claim 29, wherein the flexible connector ~~means mounted to the scanner for interacting with the scanning component~~ comprises a mechanical pivot.

41. (Canceled) The scanner of claim 40, wherein the pivot comprises a shaft mounted within a bracket holder, the shaft being mechanically attached to the scanner.

42. (Amended) The scanner of claim 29, wherein the ~~means associated with the scanner~~ comprises at least one flexible connector is attached to the scanner.

43. (Amended) The scanner of claim 30, wherein the ~~means associated with the scanner comprises at least one~~ flexible connector is attached to the substrate.

44. (Original) The scanner of claim 29, wherein the ~~means associated with the scanner~~ flexible connector comprises a plurality of resilient spring-like members, one end of each of the members attached to the scanner.

45. (Original) The scanner of claim 30, wherein the ~~means associated with the scanner~~ flexible connector comprises a plurality of resilient spring-like members, one end of each of the members attached to the substrate.

46. (Original) The scanner of claim 45, wherein there are at least 5 members.
